

Plate I



1 *Carpobrotus acquilaterale* Black. 2 *Mesembryanthemum cordifolium* L.
 3 *Lampranthus tegens* N. E. Brown. 1½. 4 *Cryophytum crystallinum*
 N.E.B. 5 *Cryophytum Aitonis* N.E.B. 6 *Disphyma australe* Black.
 7 *Mesembryanthemum laxum* Haw.

NATIVE AND INTRODUCED AIZOACEAE

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These notes are submitted in view of the fact that greater interest is being taken in plants suitable for rock gardens and dry and saline soils. It is hoped that they will serve to show the importance, and stimulate further observation and cultivation of our native plants, and at the same time be of interest to botany students.

Botanists in Europe and South Africa are busy classifying this long-neglected family. Many changes in nomenclature can be expected, especially in the genus *Mesembryanthemum*, which once contained more than 350 species. It is recognized as one of the most interesting, yet difficult, genera to classify in botanical science; the fruit structure being one of the most complicated in existence. It has been found that a difference in the habit and the character of the foliage of these plants usually coincides with some difference in the flower and fruit, indicating generic distinction.

OPENING OF FLOWERS

Our native plants are nearly allied to some in South Africa, and probably have been derived from them.

The family generally is easily recognized by its glorious flowers when in bloom, all having a family likeness, though there are endless differences in the floral organs. Some flowers open as early as 9 o'clock on a sunny morning, and will remain so until the temperature of the day declines at 6 p.m. They close for the night and re-open next morning, provided the day is fine. Others cannot be aroused until the clock has struck one, and then only provided the day is fine. Species with crimson-backed petals open at 4 p.m. and close at dusk. Finally, there are the very wide-awake flowers which lie expanded throughout the day and night, wet or fine.

It is strange that the characters afforded by the fruit of these plants had never been used for classificatory purposes before Mr. N. E. Brown, the greatest worker on the family, made the facts known recently. There are juicy edible fruits, stony-like ones, capsules remaining closed or splitting in various ways. There are seeds of transparent, paper-like thickness, and the range is to bone-like structure. Some capsules open in response to heavy rain, nature having arranged the release of the seeds when the ground is in a suitable condition to receive them. The fruits remain open while wet, but, when dry, return to their original position and prevent the seed being shed.

LEAF STRUCTURES

In many cases, the leaves are protected from animals by the bundles of tannin-bearing cells, generally placed in special tube-like arrangements. They are easily noticed as dots within the green tissue. A few species of *Mesembryanthemum* are excellent fodders, others are toxic to man and beast, while several supply excellent medicine.

Of the many fascinating leaf-forms which grow, it must suffice to mention a few of the remarkable ones. Here the leaves are the most important factor. The genus *Conophytum* ("Cone-plants"), has globe-shaped leaves closely welded, with a small orifice at the top through which the flower emerges. The *Lithops* ("Stone-faces") has a slit right across the top of the welded globular leaves and a short way down each side. The *Gibbaeum* ("Gouty plants") has one leaf shorter than the other, closely paired together, giving it the appearance of having a hump. There are other plants which have no two leaves alike. Then there are mimics, like *Mesembryanthemum Bolusii*, with large swollen leaves, so closely resembling stones that, without flowers, these "plants merge imperceptibly into their surroundings." The roots, leaves and stems have special storage reservoirs to hide them over drought periods.

There are other remarkable growth forms, such as "Sphaeroides", "Dumplings", and "Burtons", and; according to the great worker, Mrs. H. M. Bolus, of the Bolus Herbarium, South Africa, the most fascinating of the whole *Mesembryanthemum* group are the "Sphaeroides." She describes "dumplin, and lesser dumplin or dumplin and his wife" in *Notes on Mesembryanthemum and Some Allied Genera*.

I will now deal with our native species, and the plants that have been introduced into Victoria, and now appear at home in their adopted country. We have seven native and nine introduced species of Aizoaceae, representing eight genera. Our native plants can be used for rock gardens, sandbinding, saline or dry soil gardens, and as vegetable or medicinal plants.

DESCRIPTION OF THE FAMILY AIZOACEAE

Prostrate herbs or half-shrubs with regular flowers, bisexual or rarely dioecious. Calyx of four to five sepals, or divided into four to six lobes down to the ovary. Petals many, free, comate to form a tube or absent. Stamens five, by dedoublement more numerous. The Mesembryeae possess many petaloid organs, which I have referred to as petals for the convenience of readers. Ovary superior, half superior or inferior, two-many chambered, with usually many ovules in each chamber. Styles as many as the ovary chambers, freely or rarely united. Fruit a capsule or a drupe.

A family of 52 genera and 500 species.

KEY TO ORDERS

A.—Tribe Mesembryeae. Plate I (Figs. 1-7).

Calyx divided down to the ovary or forming a tube; petals many or none; ovary inferior, rarely semi-superior; fruit a capsule, drupaceous or like a nut (genera 1-6).

B.—Tribe Aizoideae.

Calyx tube more or less elongated; petals none; ovary superior; fruit a capsule, 2-5 angled, 2-5 locular, 1 seeded in each loculus. *Galenia secunda*.

C.—Tribe Mollugineae. Text (Fig. 2).

Calyx deeply five-cleft, five-parted; petals three to many or none; ovary superior; fruit a capsule, seed swollen at base. *Glinus*.

KEY TO GENERA

A. Leaves opposite, petals or petaloid organs present.	
Fruit juicy, not splitting by valves, stigmas 4-16	<i>Carpobrotus</i> 1
Fruit a capsule opening by 5 valves, stigmas 5; tubercle 2-lobed	<i>Disphyna</i> 2
Fruit a dry capsule; tubercle absent in cells	<i>Mesembryanthemum</i> 3
Leaves opposite, crowded, under 1 inch long	<i>Lampranthus</i> 4
Leaves opposite below, alternate above.	
Leaves with wavy margins, thick, flattened, conspicuously papillose	<i>Cryophyllum</i> 5
B. Leaves alternate; petals none.	
Flowers axillary; fruit a nut or berry-like, leaves slightly papillose	<i>Tetragonia</i> 6
C. Leaves opposite or in whorls.	
Flowers axillary, hairy, sessile; fruit a capsule	<i>Galenia</i> 7
Flowers with small petal-like stamens; calyx almost divided to base; leaves in false whorls	<i>Glinus</i> 8

CARPOBROTUS, 1

Carpobrotus aequilateralis (Haw.), J. M. Black, "Angular Pig's-face" (Syn. *Mesembryanthemum aequilaterale*, Haw.).

Our largest "Pig's-face", once common in all districts except north-eastern Victoria and Melbourne, where it is now met with as a cultivated plant on embankments and seashores. It makes a splendid show where grown, especially in the Melbourne Botanic Gardens.

A stout, compact, prostrate, creeping perennial 6-12 inches high with opposite triangular leaves fused at the base. The pretty greyish leaves are one to three inches long and under half an inch broad. The glistening large red flowers two to three inches across make an attractive show in bright sunlight when they are fully awake. The purplish fruit, borne on a short thick stalk, is edible. It matures in March.

The increase in wheat and sheep farming did much to prevent its increase. It is one of the plants that I would recommend for the drifting sands of the wheat belt, where it originally grew so well. The expressed juice can be taken internally in dysentery and used as a gargle in sore throats, or in the form of a lotion for burns or scalds.

Known to the aborigines as "Berudun" and "Canajong."

Carpobrotus edulis (L.) N. E. Brown. "Hottentot Fig."—

Much like the former species, but differs in having yellow flowers over three inches in diameter, borne on stalks one inch long; broader leaves half to three-quarters of an inch across, dotless, slightly channelled, attenuated at both ends.

Grown extensively, with the former native species, on railway embankments and in municipal gardens for rock covering. The fruit is edible.

DISPHYMA, 2

Disphyma australe (Solander) J. M. Black. "Rounded Pig's-face" or "Austral Disphyma." (Syn. *Mesembryanthemum australe* Col.).

Mr. J. M. Black, of Adelaide, has recently published the above new combination.

This widely spread species favours the sandy and saline soils of Victoria, and it has been found exceedingly useful as an ornamental plant for sea-shores and embankments for soil binding. It has attractive pink or purple flowers about one inch across, with five styles and whitish seed. It is a creeping perennial, stems close to the ground, rooting at joints. The leaves opposite, flattened on one side and rounded on the other one and a half to two inches long, war-boat grey and often purplish in colour.

Flowers from October to March, according to situation, and often twice in the period.

MESEMBRYANTHEMUM, 3

(Greek. Mesembria, midday; anthemon, flower. Flowers open fully in strong sunlight).

Mesembryanthemum cordifolium, L. "Heart-leaved Pig's-face" or "Fig-marigold."

One of the commonest cultivated species native to South Africa, and often found wild in Victoria. It is a very dense-growing, long-lived plant with trailing or creeping stems. Leaves grey-green, heart-shaped, rather papulose, half to three-quarters of an inch long and broad. Flowers purple borne on short terminal peduncles or rather lateral on elongated peduncles. Petals short. Excellent for rockeries, for growing under trees, and as a pot plant. I use it as a garden border, where it is kept well-trimmed.

Mesembryanthemum bicorne, Sonder. "Two-horned Pig's-face."

A smooth, many-branched plant with crowded, erect, subterete, pale green leaves, attenuated at both ends. Flowers white, about two lines long, on a short stalk, generally three together. Ripe fruit globular five-valved. A sand-binder.

Mesembryanthemum laxum. "Loose Pig's-face."

A very brilliant and showy garden plant, extensively cultivated and found growing wild as an introduction from South Africa. It has a loose stem, diffuse, shrubby; branches creeping, slender; leaves one to one and a half inches long, cylindrical or slightly three-angled, more green than the other species, dotted, usually shorter than the internodes. Flowers on long stalks with reddish petals. Grown on railway embankments and seashores.

Spelling the Generic Name

The correct spelling of the name is *Mesembryanthemum*, not *Mesembrianthemum*. This matter is fully dealt with by Dr. T. A. Sprague in the *Bulletin of Miscellaneous Information*, Kew, Botanical Gardens, England, pages 113-115, 1928.

LAMPRANTHUS, 4

Lampranthus tegens N. E. Brown. "Small-Lampranthus" or "Pig's-face" (Syn. *Mesembryanthemum tegens* F.v.M.)

A very showy native plant, suitable for rockwork, baskets and edges of gardens. A compact creeping perennial, throwing upright shoots one to three inches high, with small, opposite rounded, sometimes angular, greyish leaves half to three-quarters of an inch long. Flowers small, but very numerous, terminal, and solitary. The 25-30 pale rose staminodia and bright yellow anthers and pink petals make the plant attractive, especially on bright days.

Lampranthus falciformis (Haw.) N. E. Brown. "Sickle-leaved Pig's-face" (Syn. *M. falciformis* Haw.).

A South African plant, found growing wild as an escapee from gardens where it is often cultivated. A sub-erect plant with flexuose stems one to two feet long, with thick, falcate, acinaciform, glaucous, large dotted, clustered leaves, half to three-quarters of an inch long. Flowers pink, terminal solitary or ternate, expanding at midday; one and a half inches in diameter.

CRYOPHYTUM, 5

(Kyrön, ice; phytón, a plant).

Leaves fleshy, flat, with wavy margins, conspicuously covered with whitish green tubercles (papillae). Flowers in cymes; capsules with 4-5 reflexed valves.

Cryophytum crystallinum (L.) N. E. Brown. "Ice-plant." (Syn. *Mesembryanthemum crystallinum* L.).

A remarkable South African species, often thought to be native on account of its spread on the arid and good soils of the Wint-mera and Mallee, where it becomes an attractive feature of the landscape. It is excellent for binding drift sand, a fine pot plant,

unique in a hanging basket or in a rock garden. It has been cultivated as spinach in Europe, and has a medicinal value. As much as 43 per cent. of salts of potassium and sodium have been extracted from the dried leaves.

This handsome biennial plant favours dry soils. It first appears with a rosette of broad, fleshy, whitish-green leaves covered with warty tubercles (papillae) like a coat of ice which scintillates in the sun. A thickened tap-root, with special storage reservoirs, marks the next stage of its growth; then the elongated flowering branches, with alternate leaves, wavy so as to cast shade on some portion of the leaf surface, and thus relieve the plant from the fierce heat of the sun. The division and subdivision again and again of the branches marks the second period, which closes with flowering and seeding. Flowers white or light rose.

Cryophytum Aitoms (Jacq., N. E. B. "Angular Ice-plant." (Syn. *Mesembryanthemum angulatum* Thunb.).

A South African plant, somewhat like *C. crystallinum*, but smaller and not so robust. Stems and branches angulose, herbaceous, procumbent as well as the leaves, which are opposite, one to two inches long and half to three-quarters of an inch broad, attenuated in a broad-linear channelled petiole. The plant spreads over an area of one to three square feet, while *M. crystallinum* spreads over three to eight feet. The whole plant papillose, not so ice-like as the former; flowers dull white. Found wild at Coode Island, Geelong, and Sorrento. Useful for sand-binding and rock gardens near the coast.

TETRAGONIA, G

(Greek, tetra, four; gonia, angle).

Our two native species are worthy representatives of the genus which contains about fifty species, mainly from South Africa and South America. Flowers small, solitary or two together, in the axils of the leaves. Stamens 4-25, free, no petals or petaloid staminodia; ovary half inferior, two to eight celled, with a pendulous ovule in each cell. It has a somewhat succulent fruit with a bony covering. Leaves alternate.

KEY TO SPECIES

1. Prostrate plant, with a hard, sub-globular, angular or horned fruit *T. expansa*
2. Climbing plant, with a berry-like fruit *T. inpectinosa*

1. *T. expansa* Murr. "New Zealand Spinach" or "Native Spinach," "Warrigal Cabbage," or "South Australian Cabbage."

This species is widely cultivated as spinach and has been greatly altered by cultivators; when neglected it soon reverts to its native form. The small greenish-yellow flowers, without petals, are

borne on short stalks or almost sessile in the axils of the leaves, solitary or twin. Leaves petiolate, the larger ones ovate, triangular or broadly hastate, two to four

inches long, entire, fleshy, somewhat papillose or scaly. Fruit, green, a quarter of an inch in diameter, very variable, becoming hard with three or four erect horns. It is a nutritious and healthy vegetable. It extends from Japan to New Zealand, and is common along our sea-coasts and the sand areas inland.



FIG. 1

Tetragonia implexicoma

A. Plant

B. Flower enlarged

2. *T. implexicoma* Hk. f. "Bower Spinach".

Usually found growing among "Tea-tree" along the coast, where it is useful as an ornamental and for binding sand. A trailing climber from two to twelve feet high with petiolate leaves, three-quarters to one and a half inches long, fleshy, papillose, ovate or lanceolate. Flowers yellow inside, green outside, borne on slender stalks about half inch long. Stamens 15-25; fruit globular, blackish and berry-like, a quarter of an inch in diameter. Well worthy of attention by horticulturists for coastal planting.

GALENIA, 7

Galenia secunda Sond. "Galenia".

This South African plant is spreading in parts of Victoria, especially at Geelong, Williamstown, and Coode Island. Its attractive greyish-green and compact foliage makes it useful for small rock formations and hanging baskets. Flowers small, hairy and sessile, with ten stamens in five pairs, alternating with the petals. Ovary superior, five-celled with one ovule in each cell. Fruit opening in five valves, the ribbed seed hanging from the central column. Leaves obovate-spathulate, a quarter to three-quarters of an inch long.

GLINUS, 8

A small genus of six species, two being native to Victoria. Stamens three or five, or in bundles up to twenty, with small petal-like stamens. Ovary superior three or five celled with several ovules in each cell. Styles three to five, and the membranous capsule splitting loculicidally. The seeds have a protuberance at the base.

KEY TO SPECIES

Plant hairy; styles, five. *G. lotoides* L. "Hairy Carpet-weed."

Plant slender, nearly smooth; styles, 3. *G. Spermula* Pax. "Curled Carpet-weed."

G. lotoides is a prostrate or slightly trailing plant six inches to one foot long, with hairy, greyish leaves about half inch long. Flowers two to 4 in auxiliary clusters, with lance-shaped perianth segments. Stamens six to twenty and about five bifid staminodia. Capsule five-valved. Found north of the Dividing Range; flowers after heavy rains.

G. spermula is almost smooth with broadly lanceolate-stalked leaves up to half inch long. Perianth segments blunt. Stamens

three to four, with three styles on the summit of the three-valved capsule. Found in north-west Victoria and in all States except Tasmania; also Europe, Asia and Africa.



FIG. 2

Glinus lotoides. Hairy Carpet Weed

C. Plant

D. Flower enlarged

ABORIGINAL CAMP AT COBURG

On the banks of the Merri Creek, in the suburb of Coburg, are the remnants of an encampment of the aborigines—so far as I know, the only one recognizable in the district. It is located on the western bank of a deep pool, about midway between Gaffney Street and the well-known basalt tables behind Pentridge Stockade.

In a small excavation can be seen a very small midden of freshwater mussel shells (*Hyridella Australis*). I collected, from round about, a variety of small chippings and a few worked tools, some of which are of flint, but in the majority of cases they are of local stone and include quartz, quartzite, jasper, ironstone, and indurated mudstone, and a few bone scraps. There probably are basaltic chippings, but these were not collected on account of the Stockade wall, which is of basalt, crossing the spot. There is no doubt that the main portion of the camp was situated on a small outlier of Silurian rock, just inside Pentridge wall.

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